

CLAIMS

WE CLAIM:

1. A method of transmitting both data signals and power supply current from a network device connectable to a transmission line, the method comprising:  
5 receiving electrical power at a power input of the network device; and  
coupling a data signal between the network device and the transmission line via a coupling circuit, the coupling circuit comprising:  
at least one inductor for coupling power supply current from the power input to the transmission line.  
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2. The network device of claim 1, wherein the at least one inductor comprises a center-tapped inductor.
3. The method of claim 1, wherein the network device includes the coupling  
15 circuit.
4. The method of claim 1, wherein the coupling circuit further comprises at least one isolation transformer, the at least one isolation transformer couples data between the transmission line and the network device;  
20 wherein the at least one isolation transformer includes a data input side and a transmission line side; and  
wherein the coupling circuit includes at least one capacitor connected in series with the transmission line side of the at least one isolation transformer.
- 25 5. The method of claim 4, wherein the transmission line side of the at least one isolation transformer includes partial windings and the at least one capacitor is connected between the partial windings.
- 30 6. The method of claim 3, wherein the coupling circuit further comprises at least one series inductor, the at least one series inductor being connected between the power input and a center of the at least one center-tapped inductor.

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7. The method of claim 6, wherein the coupling circuit further comprises two capacitors, each capacitor being connected in series with the transmission line side of a different one of the two isolation transformers.

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8. The method of claim 7, wherein each of the two capacitors is connected between partial windings on the transmission line side of a different one of the two isolation transformers.

10 9. The method of claim 6, wherein the coupling circuit further comprises two series inductors, each series inductor being connected between the power input and a center of a different one of the two center-tapped inductors.

15 10. A method of transmitting both data signals and power supply current from a network device connectable to a transmission line, the method comprising:  
receiving electrical power; and  
coupling a data signal between the network device and the transmission line via a coupling circuit, the coupling circuit also provides power supply current from the power input to the transmission line, the coupling circuit comprising:

20 two isolation transformers for coupling data between the network device and the transmission line, wherein the two isolation transformers each have a data input side and a transmission line side;

two center-tapped inductors for coupling power supply current to the transmission line, wherein each center-tapped inductor is connected across the transmission line side of a different one of the two isolation transformers; and

25 two capacitors, wherein each of the two capacitors is connected between partial windings on the transmission line side of a different one of the two isolation transformers.

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